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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,142	07/26/2001	Timothy M. Sivavec	RD-28314	2727

6147 7590 01/23/2003

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EXAMINER

MITCHELL, KATHERINE W

ART UNIT	PAPER NUMBER
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3677

DATE MAILED: 01/23/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/682,142

Applicant(s)

SIVAVEC ET AL.

Examiner

Katherine W Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 29 November 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 and 44-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 and 44-66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. This application contains claims 36-43 drawn to an invention nonelected with traverse in Paper No. 4. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.
2. Applicant's election with traverse of claims 1-35 and 44-66 in Paper No. 4, Amendment A, is acknowledged. The traversal is on the ground(s) that the search would not be burdensome. This is not found persuasive because a monitoring method and a treatment system are patentably distinct and could be separately marketed, and examiner remains of the opinion that any additional search is burdensome.

The requirement is still deemed proper and is therefore made FINAL.

### ***Specification***

3. The disclosure is objected to because of the following informalities:

On page 7, "unit" refers to various units, including a sensing unit (28), a transceiver unit (26), and an unnumbered communication unit. To avoid confusion, the word "unit" should always be preceded by an adjective describing the unit, as was not done on page 7 paragraph 0033.

On page 11, paragraph 0045, "high dissolved (DO)" is missing the word – oxygen--

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 57 and 64-65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 57 depends on claim 57. Claims 58-63 are rejected as depending from claim 57. To expedite prosecution, examiner is examining as though claim 57 were dependant on claim 56.

Claims 64-65 recite the limitation "plurality of wells" in line 2 of each claim. There is insufficient antecedent basis for this limitation in the claim. Examiner notes that both claims depend from claim 44, which has an in-well sensor but no teaching of a plurality of wells, and the specification allows a plurality of sensors in a single well.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1,17,18,19, 44 are rejected under 35 U.S.C. 102(b) as being anticipated by the US Army Corps of Engineers, DG 1110-345-117, "Design Guidance for Application of Permeable Barriers to Remediate Dissolved Chlorinated Solvents" Proponent: CEMP, Feb 97, 192 pages, hereafter the Corps of Engineers papers.

Re claims 1 and 44: The Corps of Engineers papers teach a method comprising conducting a PRB treatment of a contaminated aqueous medium and in-well monitoring

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effectiveness of the PRB treatment in Sections 1,7,8, and Appendix A and E. Examiner notes that the Corps of Engineers papers section 8.2.1 on page 82 and page 81 section 8.1.2 and section 3.3.1 page 26.

Re claim 17: Reactive material (zero valent iron especially) in the barrier zone is taught by the Corps of Engineers papers on pages 28-32.

Re claims 18-19: the Corps of Engineers papers in Executive Summary paragraph 4, page V teach forming the PRB by digging a trench and placing reactive material within the trench and conducting PRB treatment within the trench, with the trench in the path of the contaminated plume.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-14, 17-35, and 44-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over EPA's "Field Applications of In Situ Remediation Technologies: Permeable Reactive Barriers", April 1999, hereafter the PRB papers, in view of Misquitta US Patent 5639380.

Re claims 1 and 44: The PRB papers teach a method comprising conducting a PRB treatment of a contaminated aqueous medium and in-well monitoring effectiveness of the PRB treatment in the Introduction pages 1-2 and pages 5, 7, 13, 20, 34, 36, 37. Multiple other teachings are throughout also. Examiner notes that the PRB papers in

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page 36 paragraph 1 and page 74 paragraph 2 for example, teach that dedicated in-situ flow sensors and ground water monitoring wells are installed to track performance.

Misquitta teaches in-well monitoring in Figs 5 and 10 and col 6 lines 47-60. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the PRB papers to include in-well monitoring as taught by Misquitta in order to obtain accurate and dynamic readings of groundwater parameters with a minimum of on-site manpower.

Re claim 17: Reactive material (zero valent iron) in the barrier zone is taught by the PRB papers page 5, 4<sup>th</sup> paragraph and in general on page 2 paragraphs 2-3.

Re claims 18-19: the PRB papers teach forming the PRB by digging a trench and placing reactive material within the trench and conducting PRB treatment within the trench, with the trench in the path of the contaminated plume on page 2 paragraph 4.

Re claims 45-46: Misquitta teaches a monitor in col 6 lines 47-60 and the abstract. Absent any criticality, the location of the monitor outside the PRB would be an obvious design choice, and be particularly likely if the PRB contained hazardous or damaging chemicals. Note that Misquitta states the obvious, in col 5 line 64 – col 6 line 6, that the test setup can be inside or outside the contaminated area based on site conditions. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the PRB papers to include the location of the monitor outside the PRB as taught by Misquitta in order to allow easy, safe, and remote monitoring of possibly hazardous conditions.

Re claims 2-14, 20-30, and 47-54: the PRB papers teach up-gradient and down-gradient monitoring wells in page 5 paragraph 5 and multiple other occurrences. Page 61 paragraph 6 teaches monitoring wells located along a transect of the PRB zone. Pages 24-25 teach a 6' wide PRB and teaches that the wells placed are along the upgradient face, the center, and the downgradient face, thus within 25 and 6 feet up- and down- gradient of the PRB and including wells within 2 feet of the PRB or within the PRB. A plurality of sensors is taught in page 13, "Results" in that pH and VOC concentrations were measured, and page 37 paragraph 5 teaches water level monitoring, thus at least 2 sensors were used. Monitoring wells have an open screen interval to allow the monitored fluid to flow into the well, as disclosed the PRB papers page 42 paragraph 4 and page 24 bottom paragraph- page 25 top paragraph. Designing the system to meet site requirements is taught in paragraphs 2-4 on page 91 and paragraphs 1-4 on page 20, and would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have located the monitoring wells with in-well sensors in certain locations relative to the contamination, both vertically and horizontally, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Examiner notes that routine experimentation, based on contamination levels and types, site conditions and limitations, soil permeability, and other factors known to influence remediation work, would be routinely required in any remediation or site assessment project, and notes that the PRB papers on page 7 paragraph teach that additional wells are determined

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based on pilot studies. Adjusting the treatment based on monitoring data is taught by the PRB papers on page 20 paragraphs 1-4, page 42, pages 93-94, and the bottom paragraph of page 39, and Misquitta in Fig 6. The method is obvious in the system description and usage.

Re claims 31-35 and 55-62: A transmitter, collector to receive a signal from the transmitter and capable of transmitting a signal to a monitor, and a communication link between said collector and monitor and the method of monitoring and transmitting contaminant data is taught in Misquitta in col 6 lines 47-60 and col 7 lines 7-21. Col 8 lines 14-40 teach wireless interconnected {web} communication links using radio communications. Transmission of data implies a remote monitor. Two way communication is taught by Misquitta in col 6 line 61- col 7 line 1, Fig 6, and col 10 lines 41-46. Outputting a contaminant report is taught by Misquitta in col 7 lines 40-49 and col 10 lines 35-36. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the PRB papers to include a transmitter, a collector to receive a signal from the transmitter and capable of transmitting a signal to a monitor, and a communication link between said collector and monitor as taught by Misquitta in order to automate the monitoring process and obtain "real-time" data and process corrections as elaborated in col 10 lines 41-46 and allow easy, safe, and remote monitoring of possibly hazardous conditions using off-the-shelf and known equipment.

Re claim 63: the PRB papers teach chemical sensors in 1<sup>st</sup> paragraph on page 20 and page 34. Misquitta teaches chemical sensors in col 7 lines 4-7.



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Re claims 64-65: A plurality of sensors in a plurality of wells {a plurality of monitoring wells with sensors} arranged along a substantially longitudinal axis of the PRB zone facing the fluid flow (AA-116,115, and 113) and substantially along a transect to the PRB zone (AA-111,112,113, and 114) is taught in Fig. 1.

Re claim 66: A PRB and a sensor located along a substantially longitudinal axis of the PRB zone facing the fluid flow or substantially along a transect to the PRB zone is taught in the PRB papers on page 61 paragraph 6. Examiner notes it would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have located the sensor and well in the specific area where data is best generated, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

10. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the PRB papers in view of Misquitta US Patent 5639380 as applied to claims 1 and 17 above, and further in view of Salvo et al. US Patent 6356205. As discussed above, the PRB papers in view of Misquitta teach all the elements except monitoring effectiveness using at least pH, O-R potential, or specific conductivity. The PRB papers teach monitoring based on electron acceptors and donors entering and being released from the barrier in page 13 paragraph 3. Salvo et al teach in Fig 3 and col 7 lines 42-45 that pH, O-R potential, and/or specific conductivity are measured and used to determine effectiveness. Salvo et al in col 8 lines 9-13 and Borden et al. in col 5 lines 37-46 and col 11 lines 33-45 teach that determining the nature, extent and velocity of a

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contaminant plume are part of the treatment method. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the PRB papers in view of Misquitta to include monitoring effectiveness using at least pH, O-R potential, or specific conductivity, as taught by Salvo et al., in order to monitor specific parameters indicative of groundwater remediation that can be determined by sensors in monitoring wells.

11. Claims 2-14, 20-35, and 45-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US Army Corps of Engineers, DG 1110-345-117, "Design Guidance for Application of Permeable Barriers to Remediate Dissolved Chlorinated Solvents" Proponent: CEMP, Feb 97, 192 pages, hereafter the Corps of Engineers papers, in view of Misquitta US Patent 5639380.

Re claims 45-46: As discussed in the 102 (b) section above, the Corps of Engineers papers teach all the elements except a remote monitor. Misquitta teaches a monitor in col 6 lines 47-60 and the abstract. Absent any criticality, the location of the monitor outside the PRB would be an obvious design choice, and be particularly likely if the PRB contained hazardous or damaging chemicals. Note that Misquitta states the obvious, in col 5 line 64 – col 6 line 6, that the test setup can be inside or outside the contaminated area based on site conditions. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Corps of Engineers papers to include the location of the monitor outside the PRB as taught by Misquitta in order to allow easy, safe, and remote monitoring of possibly hazardous conditions.

Re claims 2-14, 20-30, and 47-54: the Corps of Engineers papers teach up-gradient and down-gradient monitoring wells in paragraph 3 page 56. Fig. 8.1 teaches monitoring wells located along a transect of the PRB zone. A plurality of sensors is taught in page 26, paragraph 2 and page 81 paragraph 2. Monitoring wells have an open screen interval to allow the monitored fluid to flow into the well, as disclosed the Corps of Engineers papers section 8. Designing the system to meet site requirements is taught in first paragraph page vii and section 1.8 page 9 and paragraph 5 page 48. and would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have located the monitoring wells with in-well sensors in certain locations, such as within 2, 6, or 25 feet of the PRB relative to the contamination, both vertically and horizontally, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Examiner notes that routine experimentation, based on contamination levels and types, site conditions and limitations, soil permeability, and other factors known to influence remediation work, would be routinely required in any remediation or site assessment project, and notes that the page 84 paragraph 1 of Corps of Engineers papers teach that additional wells are determined based on pilot studies. Adjusting the treatment based on monitoring data is taught by section 8 and the Executive Summary, and Misquitta in Fig 6. The method is obvious in the system description and usage.

Re claims 31-35 and 55-62: A transmitter, collector to receive a signal from the transmitter and capable of transmitting a signal to a monitor, and a communication link

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between said collector and monitor and the method of monitoring and transmitting contaminant data is taught in Misquitta in col 6 lines 47-60 and col 7 lines 7-21. Col 8 lines 14-40 teach wireless interconnected {web} communication links using radio communications. Transmission of data implies a remote monitor. Two way communication is taught by Misquitta in col 6 line 61- col 7 line 1, Fig 6, and col 10 lines 41-46. Outputting a contaminant report is taught by Misquitta in col 7 lines 40-49 and col 10 lines 35-36.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Corps of Engineers papers to include a transmitter, a collector to receive a signal from the transmitter and capable of transmitting a signal to a monitor, and a communication link between said collector and monitor as taught by Misquitta in order to automate the monitoring process and obtain "real-time" data and process corrections as elaborated in col 10 lines 41-46 and allow easy, safe, and remote monitoring of possibly hazardous conditions using off-the-shelf and known equipment.

Re claim 63: Corps of Engineers papers teach in-well chemical sensors in page 81 section 8.1.2 and section 3.3.1 page 26. Misquitta teaches chemical sensors in col 7 lines 4-7.

Re claims 64-65: A plurality of sensors in a plurality of wells {a plurality of monitoring wells with sensors} arranged along a substantially longitudinal axis of the PRB zone facing the fluid flow and substantially along a transect to the PRB zone is

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taught in Fig. 8.1, sections 8.1.1 - 8.1.3, pages 76-82 and sections 3.3, 3.3.1, and 3.3.2, pages 26-27 of the Corps of Engineers papers.

Re claim 66: A PRB and a sensor located along a substantially longitudinal axis of the PRB zone facing the fluid flow or substantially along a transect to the PRB zone is taught in the Corps of Engineers papers Fig 8.1 and section 8. Examiner notes it would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have located the sensor and well in the specific area where data is best generated, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

12. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Corps of Engineers papers in view of Misquitta US Patent 5639380 as applied to claims 1 and 17 above, and further in view of Salvo et al. US Patent 6356205. As discussed above, the Corps of Engineers papers in view of Misquitta teach all the elements except monitoring effectiveness using at least pH, O-R potential, or specific conductivity. The Corps of Engineers papers in page 81 section 8.1.2 and section 3.3.1 page 26 teach monitoring based on electron acceptors and donors entering and being released from the barrier. Salvo et al teach in Fig 3 and col 7 lines 42-45 that pH, O-R potential, and/or specific conductivity are measured and used to determine effectiveness. Salvo et al in col 8 lines 9-13 and Borden et al. in col 5 lines 37-46 and col 11 lines 33-45 teach that determining the nature, extent and velocity of a contaminant plume are part of the treatment method. Therefore, it would have been

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obvious to one of ordinary skill in the art at the time the invention was made to have modified the Corps of Engineers papers in view of Misquitta to include monitoring effectiveness using at least pH, O-R potential, or specific conductivity, as taught by Salvo et al., in order to monitor specific parameters indicative of groundwater remediation that can be determined by sensors in monitoring wells.

### ***Response to Arguments***

13. Applicant's arguments filed Nov 29, 2002 with respect to the restriction requirement have been fully considered but they are not persuasive. As discussed above, the restriction is maintained.

14. Applicant's arguments with respect to claims 1-35 and 44-66 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Borden et al., "Control of BTEX Migration Using a Biologically Enhanced Permeable Barrier", Winter 1997 GWMR, pgs. 70-80.

Borden et al., US EPA/600/SR-96/145, "Enhanced Bioremediation of BTEX Using Immobilized Nutrients: Field Demonstration and Monitoring", Dec 1996, 4 pages.

Borden et al., Summary of Proposed Work for Technology Application of Low Cost Emplacement of Insoluble organic substrate for enhanced in situ reductive dechlorination of halogenated aliphatic hydrocarbons: Dover Air Force Base, Delaware; Oct 18, 1999, 5 pages.

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EPA, Evaluation of Subsurface Engineered Barriers at Waste Sites, Aug 1998,  
148 pages.

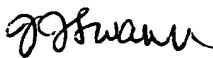
Others on form PTO-892.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine W Mitchell whose telephone number is 703-305-6713. The examiner can normally be reached on Tues-Fri 9 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. J. Swann can be reached on 703-306-4115. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-308-8623 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

kwm  
January 15, 2003

  
J. J. SWANN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600